CLAIMS:

1.   An apparatus for performing spatial scalable compression of video information
captured in a plurality of frames, comprising:
            a base layer encoder for encoding a bitstream;
            an enhancement layer encoder for encoding a residual signal having a higher
resolution than the base layer; and
            a multiplier unit for attenuating the residual signal, the residual signal being
the difference between the original frames and the upscaled frames from the base layer;
            a picture analyzer for performing segmentation and determining which group
of pixels in each frame have at least a predetermined chance of having a predetermined
characteristic and calculating a gain value for the content of each pixel, wherein the gain for
pixels which have the at least predetermined chance of having the predetermined
characteristic is biased toward 1 and the gain for other pixels is biased toward 0, wherein the
multiplier uses the gain value to attenuate the residual signal.

2.   The apparatus according to claim 1, wherein segmentation size is one pixel.

3.   The apparatus according to claim 1 or 2, wherein the picture analyzer
comprises a color-tone detector for detecting pixels which have a predetermined color tone.

4.   The apparatus according to claim 3, wherein the color-tone detector is a skin-
tone detector.

5.   The apparatus according to claim 3, wherein the color-tone detector is a
natural vegetation color detector.

6.   The apparatus according to claim 1, wherein the picture analyzer comprises:
            a depth calculation unit for determining the depth of each pixel in the frame;

a segmentation unit for determining which pixels comprise various segments of images in each frame, wherein the gain for pixels which are part of objects in the foreground of the image in each frame is biased toward 1.

5   7.   The apparatus according to claim 6, wherein the picture analyzer further comprises at least one color-tone detector, wherein the gain for pixels which have a predetermined color-tone or are part of objects in the foreground of the image in the frame is biased toward 1.

10   8.   A layered encoder for encoding and decoding a video stream, comprising:

a downsampling unit for reducing the resolution of the video stream;

a base encoder for encoding a lower resolution base stream;

an upconverting unit for decoding and increasing the resolution of the base stream to produce a reconstructed video stream;

15   a subtractor unit for subtracting the reconstructed video stream from the original video stream to produce a residual signal;

a picture analyzer for performing segmentation and determining which groups of pixels in each frame have at least a predetermined chance of having a predetermined characteristic and calculating a gain value for the content of each pixel, wherein the gain for

20   pixels which have the at least predetermined chance of having the predetermined characteristic is biased toward 1 and the gain for other pixels is biased toward 0;

a first multiplier unit which multiplies the residual signal by the gain values so as to remove bits from the residual signal which do not have the predetermined chance of having the predetermined characteristic;

25   an enhancement encoder for encoding the resulting residual signal from the multiplier and outputting an enhancement stream.

9.   The layered encoder according to claim 8, wherein segmentation size is one pixel.

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10.   The layered encoder according to claim 8 or 9, wherein the picture analyzer comprises a color-tone detector for detecting pixels which have a predetermined color tone.

11.   The layered encoder according to claim 10, wherein the color-tone detector is a skin-tone detector.

12.   The layered encoder according to claim 10, wherein the color-tone detector is a natural vegetation color detector.

13.   The layered encoder according to claim 8, wherein the picture analyzer comprises:

a depth calculation unit for determining the depth of each pixel in the frame;

a segmentation unit for determining which pixels comprise various segments of images in each frame, wherein the gain for pixels which are part of objects in the foreground of the image in each frame is biased toward 1.

14.   The layered encoder according to claim 13, wherein the picture analyzer further comprises at least one color-tone detector, wherein the gain for pixels which have a predetermined color-tone or are part of objects in the foreground of the image in the frame is biased toward 1.

15.   A method for providing spatial scalable compression using adaptive content filtering of a video stream, comprising the steps of:

downsampling the video stream to reduce the resolution of the video stream;

encoding the downsampled video stream to produce a base stream;

decoding and upconverting the base stream to produce a reconstructed video stream;

subtracting the reconstructed video stream from the video stream to produce a residual stream;

determining which segments or pixels in each frame have at least a predetermined chance of having a predetermined characteristic;

calculating a gain value for the content of each segment or pixel, wherein the gain for pixels which have the at least predetermined chance of having the predetermined characteristic is biased toward 1 and the gain for other pixels is biased toward 0;

multiplying the residual stream by the gain values so as to remove bits from the residual stream which do not have the predetermined chance of having the predetermined characteristic; and

encoding the resulting residual stream and outputting an enhancement stream.